WS19.5 Characterization of fungal colonization phenotypes in pediatric cystic fibrosis lung disease

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Objectives: Fungi, particularly *Aspergillus* and *Candida* species, are increasingly found in cystic fibrosis (CF) airway fluids. However, their relationship to other CF pathogens, medications and lung function, especially in CF children, remains poorly understood. To address this question, we analyzed the associations of fungal colonization with microbiological and clinical parameters of pediatric CF patients.
Methods: Fungal colonization was categorized in n = 128 CF patients based on Chotirmall et al. (Chest 2010). *Candida albicans* (CA) was the most prevalent fungus detected in CF airway fluids, followed by *C.* non-*albicans* > *Aspergillus fumigatus* (AF) > *A.* non-*fumigatus* species. Colonization with CA correlated positively with age, inhaled antibiotic use, and *Aspergillus* species, while an inverse correlation with *Haemophilus* and no association with *S. aureus* or *Pseudomonas* was found. Colonization with AF correlated positively with age, inhaled antibiotics, *Pseudomonas*, *Stenotrophomonas*, atypical mycobacteria and CF-related diabetes and inversely with *Haemophilus*. ABPA showed no correlation with AF colonization, but with non-*fumigatus* species and use of azithromycin. Colonization with AF or CA correlated inversely with cross-sectional FEV1, but not with MEF25. Colonization with AF correlated with longitudinal FEV1 decline.
Conclusion: This study suggests that colonization with CA or AF is affected by bacterial co-colonization and may modulate lung function already in pediatric CF.

WS19.6 Changes in the weather and the respiratory health of adults with cystic fibrosis

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Objectives: Changes in the weather are associated with adverse outcomes in asthma and COPD but have been little studied in CF. We conducted a prospective study to investigate the impact of climate and season on rates of viral respiratory infection (VRI) and pulmonary exacerbation (PEx) in adults with CF.
Methods: 98 adults with CF living in North-West England were followed for 12 months. Patients were seen every 2 months and additionally at onset of PEx. Sputum, nose- and throat-swabs were tested at each visit for 9 respiratory viruses using PCR assays. Hourly temperature and relative humidity measurements in central Manchester were recorded. Data were analysed with generalised estimating equation models.
Results: 29% and 37% of visits met criteria for VRI and PEx respectively. Rhinovirus accounted for 72% of viruses. Incidence of rhinovirus was high throughout the year but peaked in autumn. Rates of other viruses peaked in winter and were very low during summer. Rhinovirus infection was associated with higher mean temperatures (OR 1.08; 95%CI 1.03–1.13; $p = 0.001$) and lower relative humidity (OR 0.98; 95%CI 0.96–0.997; $p = 0.02$). Non-rhinovirus VRI was strongly associated with lower mean temperatures (OR 0.87; 95%CI 0.83–0.92; $p < 0.001$) and higher weekly relative humidity (OR 1.05; 95%CI 1.01–1.08; $p = 0.007$). There was no significant association between incidence of PEx and climate variables. The incidence of PEx and antibiotic usage overall did not display seasonal variability.
Conclusion: There is a clear seasonal pattern to VRI in adults with CF. The incidence of VRI but not PEx is associated with changes in weather conditions.

WS19.7 Assessment of habitual physical activity in adults with cystic fibrosis

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Introduction: In Cystic Fibrosis (CF) improving physical activity (PA) increases sputum clearance, respiratory muscle strength and leads to better quality of life. Recent studies have shown that the level of daily physical activity may have a positive impact on exercise tolerance, on nutritional status and on the rate of decline of FEV_1.
Aims: To date there is relatively little information about objectively measured habitual physical activity in CF.
Methods: Twenty stable CF patients (mean age 33±8SD yrs; FEV_1 2.6±0.6 l), were studied at rest and during symptom-limited incremental exercise test (CPET) and during 6MWT. Daily physical activity was assessed by means of: (1) an accelerometer (SenseWear, SW), that subjects wore for 4 consecutive days, including weekends, and (2) the Habitual Activity Estimation Scale Questionnaire (HAESQ).
Results: There was no difference between the weekdays and weekends recordings in any activity variable. We found no agreement in physical activity measured by SW vs HAESQ. We found a close relationship between SW energy expenditure and FEV_1 during both weekdays and weekend ($r = 0.52$; $p = 0.01$ and $r = 0.51$; $p = 0.02$) and SW activities of moderate intensity vs VO_2 peak ($r = 0.5$; $p = 0.02$) at CPET. Distance at 6MWT was not correlated to any physical activity variables, either at SW or HAESQ.
Conclusions: Adults with CF have similar levels of activity at weekends and weekdays. Activity levels measured by the subjective methods and by the objective monitoring, i.e., SW vs HAESQ, seems to provide different information on the habitual daily physical activity. Physical activity is related to the maximum exercise capacity and to the degree of the airflow obstruction.

WS19.8 Use of palivizumab to prevent respiratory syncytial virus (RSV) infection in cystic fibrosis. A 10 year retrospective review pre and post introduction of palivizumab prophylaxis in Northern Ireland

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RSV causes considerable morbidity and mortality in children. In cystic fibrosis (CF) viral infections are associated with worsening respiratory symptoms and bacterial colonization. Palivizumab is effective in reducing RSV hospitalisation in high risk patient groups. Evidence regarding its effectiveness and safety in CF is inconclusive. CF screening in N. Ireland enabled timely palivizumab prophylaxis, becoming routine in 2002.
Objectives: To determine the effect of palivizumab on hospitalization for RSV in the first year and compare lung function and bacterial colonization at age 6 yrs for those born before ('pre') and after ('post') palivizumab prophylaxis was introduced.
Methods: A retrospective review was conducted for all patients diagnosed with CF over a 10 year period from 1998 to 2007. Hospitalization for RSV and time to *Pseudomonas* (PA) 1st isolate, lung function and growth parameters aged 6 yrs were recorded. Comparisons were made for outcomes pre and post introduction of palivizumab.
Results: 82 children were included; 37 pre and 45 post palivizumab. 8 children pre and 2 post required hospitalization for RSV infection (median stay 9 vs 3 days). PA 1st isolate was significantly earlier in the post vs pre group (median 85 vs 144 months), $p < 0.0001$. Chronic PA infection at 6 yrs remains low in both groups. We found similar rates of *Staph Aureus* infection, FEV1 and growth parameters at 6 yrs.
Conclusion: Palivizumab was effective in reducing number and duration of RSV related hospitalization. Surprisingly, we found a significantly earlier time to 1st isolate of PA in palivizumab recipients which we could not explain by altered or improved diagnostic tests.